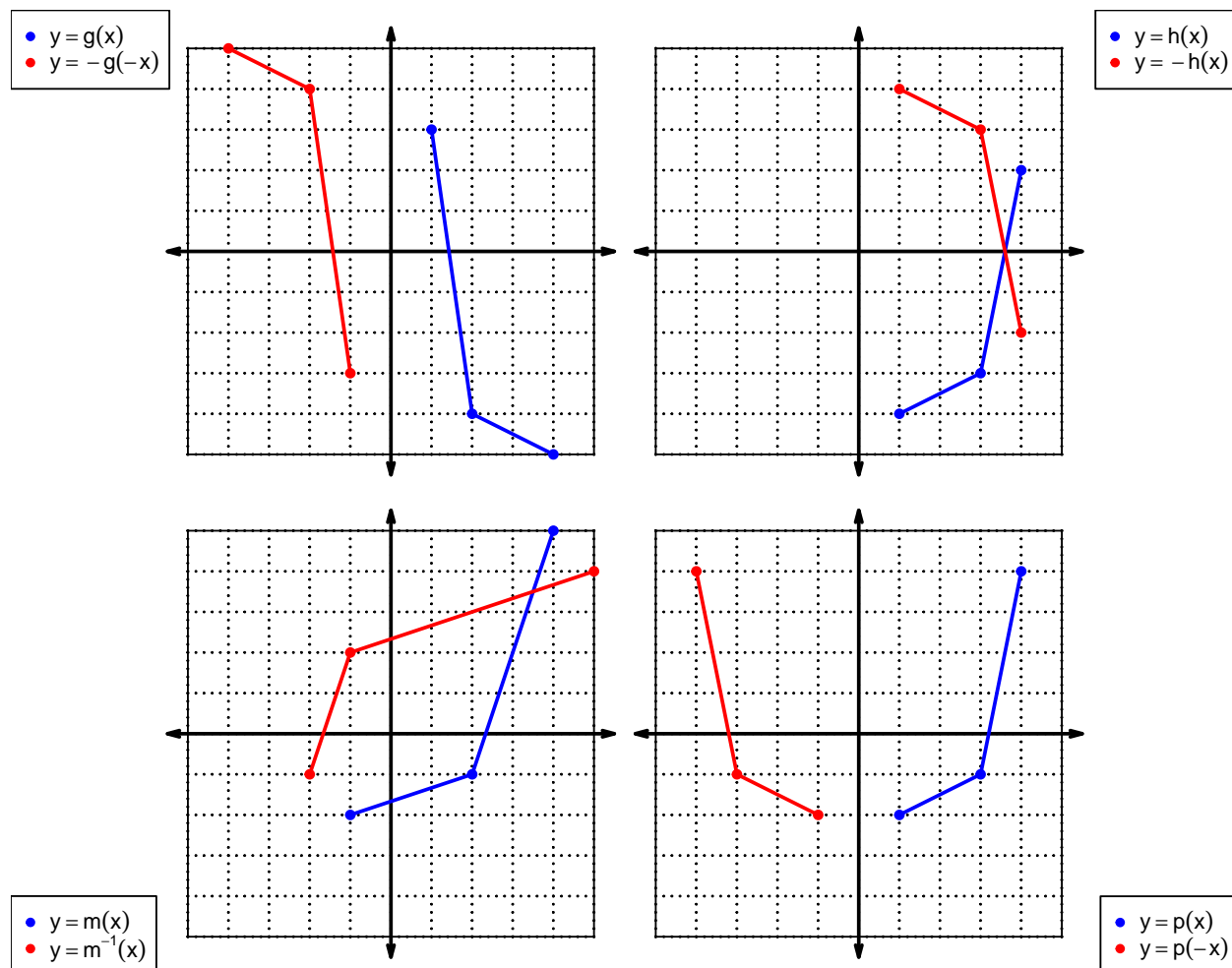# Exam: Function Reflections (Solution version 46)

1. Let function f be defined by the polynomial below:

$$f(x) \ = \ -7x^5 + 2x^4 + 5x^3 - 9x^2 - 3x - 8$$

Draw lines that match each function reflection with its polynomial:

Reflections	Polynomials

$-f(-x)$

$-f(x)$

$f(-x)$

$7x^5 - 2x^4 - 5x^3 + 9x^2 + 3x + 8$

$-7x^5 - 2x^4 + 5x^3 + 9x^2 - 3x + 8$

$7x^5 + 2x^4 - 5x^3 - 9x^2 + 3x - 8$

2. In each xy plane shown below, a function is graphed with blue. Draw the indicated reflections (as a second curve, indicated in legend) with black (or with whatever you have). The x axis is horizontal and the y axis is vertical (as typical), and the scale is equal on both axes.

- $y = g(x)$
- $y = -g(-x)$

- $y = h(x)$
- $y = -h(x)$

- $y = m(x)$
- $y = m^{-1}(x)$

- $y = p(x)$
- $y = p(-x)$

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For all questions on this page, the functions f, g, and h are defined by the table below.

x	$f(x)$	$g(x)$	$h(x)$
1	8	2	4
2	2	7	5
3	7	4	2
4	6	5	9
5	3	6	1
6	9	1	6
7	4	9	3
8	5	3	7
9	1	8	8

3. Evaluate $g(5)$.

$$g(5) = 6$$

4. Evaluate $h^{-1}(4)$.

$$h^{-1}(4) = 1$$

5. By filling more rows of the table, it is possible to make function h **odd**. If that were done, what would be the value of $h(-9)$?

If function h is odd, then
$$h(-9) = -8$$

6. By filling more rows of the table, it is possible to make function f **even**. If that were done, what would be the value of $f(-3)$?

If function f is even, then
$$f(-3) = 7$$

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7. A function, f, is **even** if $f(x) = f(-x)$ for all x in the domain. A function, g, is **odd** if $g(x) = -g(-x)$ for all x in the domain.

   Let polynomial p be defined with the following equation:

   $$p(x) = x^2 - x$$

   a. Express $p(-x)$ as a polynomial in standard form.

   $$p(-x) = (-x)^2 - (-x)$$
   $$p(-x) = x^2 + x$$

   b. Express $-p(-x)$ as a polynomial in standard form.

   $$-p(-x) = -\left(x^2 + x\right)$$
   $$-p(-x) = -x^2 - x$$
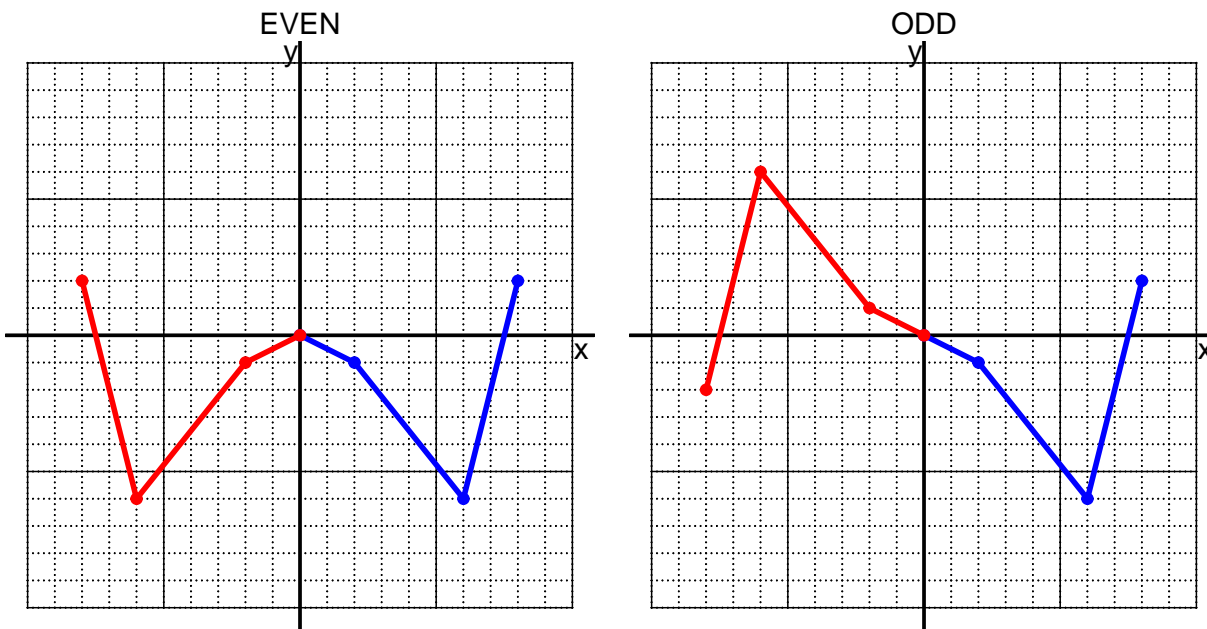
   c. Is polynomial p even, odd, or neither?

   neither

   d. Explain how you know the answer to part c.

   We see that $p(x)$ is not equivalent to either $p(-x)$ or $-p(-x)$, so p is neither even nor odd.

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8. I have drawn half of a function. Draw the other half to make it even or odd.

EVEN

ODD

9. Let function f be defined with the equation below.

$$f(x) = 8(x+9)$$

a. Evaluate $f(2)$.

step 1: add 9
step 2: multiply by 8

$$\color{red}f(2) = 8((2)+9)$$
$$\color{red}f(2) = 88$$

b. Evaluate $f^{-1}(96)$.
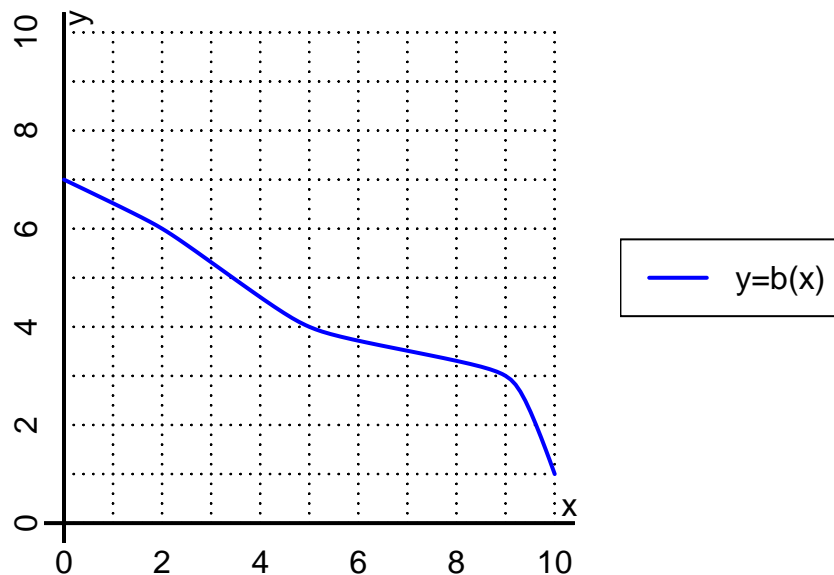
step 1: divide by 8
step 2: subtract 9

$$\color{red}f^{-1}(x) = \frac{x}{8} - 9$$
$$\color{red}f^{-1}(96) = \frac{(96)}{8} - 9$$
$$\color{red}f^{-1}(96) = 3$$

4

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10. The function b is represented by the curve $y = b(x)$ graphed below.

a. Evaluate $b(5)$.

$$b(5) = 4$$

b. Evaluate $b^{-1}(6)$.

$$b^{-1}(6) = 2$$

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11. Function f is defined by the table below.

    a. Complete the columns for $-f(x)$ and $f(-x)$ and $-f(-x)$.

x	$f(x)$	$-f(x)$	$f(-x)$	$-f(-x)$
-2	7	-7	7	-7
-1	-6	6	-6	6
0	0	0	0	0
1	-6	6	-6	6
2	7	-7	7	-7

b. Is function f even, odd, or neither?

even

c. How do you know the answer to part b?

Function f is even because column $f(-x)$ matches column $f(x)$ exactly.